

NintendoWare for Cafe Overview

2012/02/15

Version 1.2

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1 Introduction

NintendoWare for Cafe is the collective name for the tools and libraries used to develop graphics and sounds for Cafe game software. NintendoWare for Cafe has been developed to provide Cafe software developers with tools and libraries widely used in game software so developers can focus on game creation itself.

This document provides an overall view of the NintendoWare for Cafe package, including an outline of its tools and libraries.

In this document, NintendoWare for Cafe is abbreviated as NW4F.

2 NintendoWare for Cafe Structure

2.1 Development Environment

NintendoWare for Cafe provides the following four major development environments.

- Graphics development environment
- Layout development environment
- Effect development environment
- Sound development environment

Broadly categorized, these development environments consist of Windows applications that create data, converters that convert data created by the application to be used for Cafe, and libraries for playing data converted by the converter for Cafe.

2.2 Graphics Development Environment

The NintendoWare for Cafe graphics environment supports the building of a 3D graphics control environment to support the Cafe programmable shader.

With Cafe, a designed rendering pipeline can be built for each game development project with the programmable shader. Rendering game-specific expressions with the proper execution performance is possible by building a render engine by having the user select the shading algorithms and render path required for the game. Furthermore, an embedded viewer library is provided to allow a preview environment for the render engine built by the user to be easily embedded in the game program.

We have been providing a complete 3D graphics control environment that included a render engine with NintendoWare for Revolution and NintendoWare for CTR. However, because it is necessary for the user to select the features required for the game in order to properly use the Cafe programmable shader, neither a render engine that includes a default shader nor a standalone application viewer can be provided. The features dependent on a specific render engine can only be provided as a sample.

NW4F graphics is primarily made up of the following items.

- The DCC plugin outputs 3D model, texture, and animation intermediate files from Maya, 3ds Max, Softimage, and Photoshop DCC tools.
- 3DEditor edits the Cafe-specific parameters in the intermediate file.
- The command line tool provides various tools such as intermediate file optimization and conversion to runtime binary files.
- The graphics runtime library supports building the game render engine by the user.
- The edit library supports the building the preview environment in the game with the render engine built by the user.

2.3 Layout Development Environment

For the Layout development environment, NW4F provides a group of tools required to create layout data for Cafe and libraries for reproducing the layouts on Cafe systems, based on the layout data created.

The 2D development environment consists of the following.

- Layout library
- NW4F LayoutEditor
- Converter
- Layout Viewer

The NW4F Layout Development Environment is based on the previous NintendoWare layout. For that reason, most features of the layout for NintendoWare for Revolution and NintendoWare for CTR are supported.

2.3.1 Emulated Features

- Placement feature that uses panes
- Font rendering using text box panes
- All animation features (panes, all color types, texture patterns, etc.)
- PC viewer and Preview on the production device (also supports DRC display)

2.3.2 Added Features

2.3.2.1 Refined Material Setting Items

The degrees of freedom were simplified to the required minimum in consideration of process efficiency and ease-of-use for the designer.

2.3.2.2 Part Features

This feature builds layouts efficiently by combining multiple layouts.

2.3.2.3 Control Features

This mechanism controls the behavior of layout animation.

By applying this mechanism, it becomes easy to mass produce data following behavior specifications. In addition, it becomes easy to build a viewer to confirm the display of behavior in the game without requiring the help of a programmer in the designer environment.

2.3.2.4 Added Horizontal Window Panes

Added window panes that simplify settings and allow faster rendering.

2.3.2.5 Special Effects Fonts

Support added for rendering shaded fonts and italic fonts.

2.3.2.6 Performance Optimization

Substantial optimization has been implemented since the initial version.

2.3.3 Eliminated Features

- Animation recursive association specifications
- Detailed material settings that include hardware features
- Support for TGA with added information
Replaced with normal TGA.
Formats that are normally set have been modified to reduce difficulties. NW4C-TGA can also be read without modification.
- Eliminated the ArchiveFont, PackedFont, and PairFont font modules

2.4 Effect Development Environment

NintendoWare for Cafe is made of the following tools and libraries.

- Effect library
- EffectMaker
- EffectViewer

2.4.1 Effect Library

The effect runtime library plays back effect data (eset) edited with EffectMaker for Cafe on the Cafe production version or in a Windows environment.

Currently, the Effect library supports the following effect expressions.

- Particles
 - Soft particles
 - Volume particles
 - Refraction particles
 - Distorted particles
- Stripes (an effect that draws a tail on the particle trajectory)

2.4.2 EffectMaker

The Effect Maker tool creates and edits effect data (eset). See the EffectMaker manual for details.

2.4.3 EffectViewer

EffectViewer previews effect data edited with EffectMaker for Cafe. See the EffectViewer manual for details.

2.5 Sound Development Environment

The sound development environment is used to carry out sound development for Cafe game software.

The NW4F sound development environment provides a group of tools for creating sound data for Cafe from data created using standard sequencer software and wave file editing software, and a library for playing that sound data.

The sound development environment consists of the following.

- Sound library
- NW4F SoundMaker
- Converter
- SoundPlayer

The NW4F sound development environment is based on the NintendoWare for CTR sound development environment. For that reason, most sound features of NintendoWare for CTR are supported.

2.5.1 DRC Sound Output

Sound output from DRC is easily performed by switching parameters.

2.5.2 Multicore Support

Sound threads can be easily operated with the sub core.

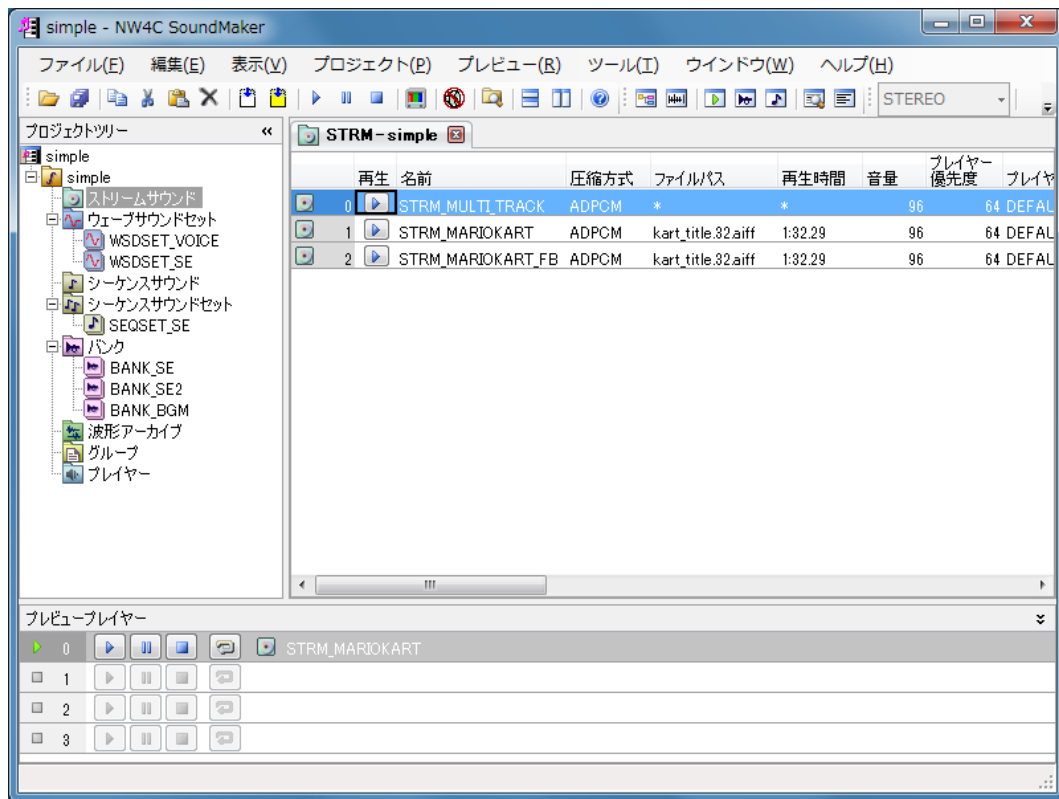
2.5.3 Effect Library

Waveform files (WAV or AIFF files) and standard MIDI files (MID files) can be used without modification.

The following sound development projects that were provided previously can be used by using the NW4F SoundMaker import feature and converting them to NW4F projects.

- NITRO-SoundMaker
- NintendoWare for Revolution
- NintendoWare for CTR

Figure 2-1 NW4C SoundMaker



3 Runtime Library Overview

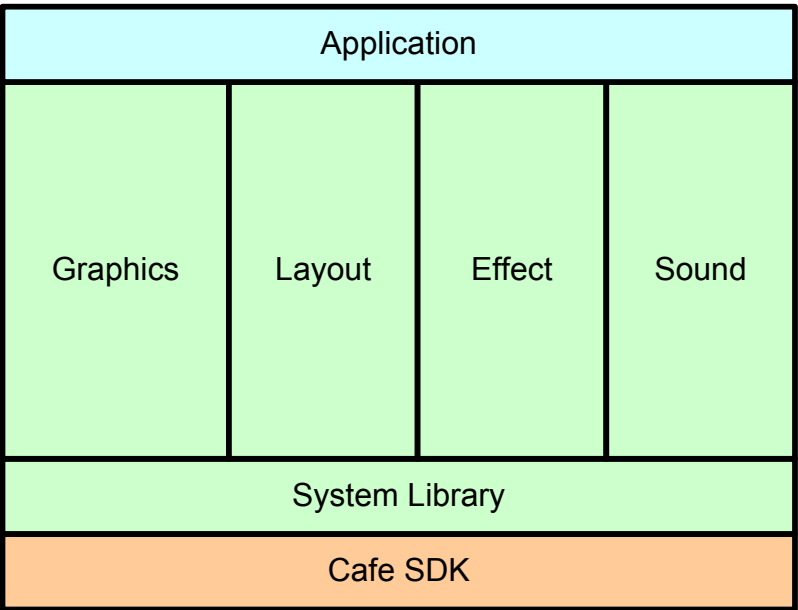
3.1 Runtime Library Configuration

Broadly categorized, the NW4F runtime library consists of the following five libraries.

- System library
- Graphics library
- Layout library
- Effect library
- Sound library

Broadly categorized, the NW4F runtime library consists of the following five libraries.

Figure 3-1 Runtime Library Configuration



3.1.1 System Library

The System Library provides the following classes and functions used by higher order libraries.

- Numerical Functions
- Utilities
- Classes for Debugging
- Fonts

3.2 Library Coding Language

The NW4F runtime library has been written in C++. The supported compiler is Green Hills Software MULTI.

3.3 Build Environment

The following tools and environment are required to build and debug applications that use NW4F.

- Cafe SDK
- CAT-DEV
- Cygwin

3.4 Library Source Code

Source code for the NW4F runtime library is included in the NW4F package. Note, however, that operations cannot be guaranteed if source code for the NW4F runtime library is modified.

3.5 PC Runtime Development Environment

The NW4F libraries support building and executing on a PC.

However, note that this does not mean that an environment is ready to run programs created for Wii U directly, but rather that NW4F libraries can build on a PC and simply support incorporation into programs created for PCs.

Also, because it is not something that can accurately reproduce Wii U behavior, perform final confirmation of expressions and performance on the production device.

See [Operating Environment] in the release notes for required PC specifications.

3.6 Sample Demos

A sample demo has been prepared for each runtime library. Sample demo source code can be found in the following folder.

```
NW_Cafe\Demo
```

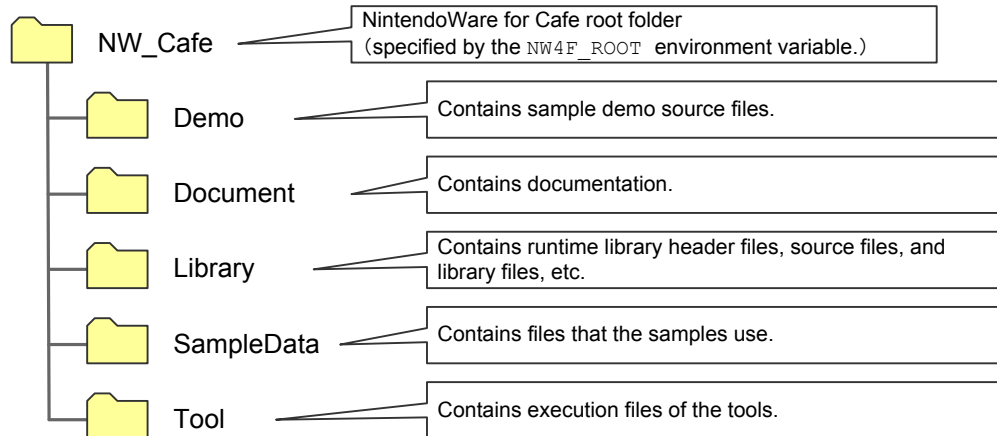
For a description of sample demos, see the function reference:

```
NW_Cafe\Document\API\index.html
```

4 Folder Structure

When you install NW4F, the `NW_Cafe` folder is created and it contains all the application and libraries provided with NW4F. The NW4F folder structure is shown below.

Figure 4-1 Folder Structure



Revision History

Version	Revision Date	Category	Description
1.2	2012/02/15	Changed	• Changed the embedded viewer library to the edit library.
1.1	2011/08/22	Added	• Added the Graphics Development Environment. • Added the Effect Development Environment.
1.0	2011/07/06	—	Initial version.

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